



FOURTH QUARTER 2017 MONITORING REPORT
UIC PERMIT AZ396000001 AND APP PERMIT 101704
FLORENCE COPPER PROJECT, FLORENCE, ARIZONA

Florence Copper Inc.
1575 W. Hunt Highway
Florence, AZ 85132

January 26, 2018

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Ms. Nancy Rumrill
U.S. Environmental Protection Agency
Region 9, Ground Water Office, WTR-9
75 Hawthorne Street
San Francisco, California 94105-3901

Sent U.S. Certified Mail
70151520000151881555

Subject: Fourth Quarter 2017 Monitoring Report
Underground Injection Control (UIC) Permit Number AZ396000001

Dear Ms. Rumrill:

Florence Copper Inc. is submitting this report in accordance with the reporting requirements of Parts II.G.2.(a) through (j) of the UIC Permit No. AZ396000001 issued on May 1, 1997.

Background Information

The Florence Copper project is an in-situ copper extraction facility subject to four related permits issued by the United States Environmental Protection Agency (USEPA) and the Arizona Department of Environmental Quality (ADEQ).

Sitewide permits covering the 1997-98 Pilot Test Facility and future operations

- USEPA Underground Injection Control (UIC) No. AZ396000001 dated May 1, 1997
- ADEQ APP No. P-101704 dated October 13, 2017

Under the Sitewide permits, an initial pilot test wellfield, a small leachate processing facility, and a double-lined evaporation pond were constructed. The pilot test operated from October 31, 1997 to February 9, 1998. The test area was rinsed until September 1, 2004. Cessation of hydraulic control for testing was approved by both agencies and the wellfield has since remained inactive. Subsequently, no Sitewide permit related activities have taken place.

This report documents monitoring activities related to Sitewide UIC AZ396000001. This information is also submitted to the ADEQ for APP P-101704.

2018-19 Pilot Test Facility

- USEPA UIC No. R9UIC-AZ3FY11-1 dated December 20, 2016.
- ADEQ Temporary APP No. P-106360 dated August 3, 2016.

The 2016 permits authorize a new pilot test facility with separate monitoring requirements inside the area of the Sitewide permits. The facility received authorization to proceed with pre-operational activities on July 13, 2017. We are currently completing installation of the pilot test wellfield in preparation for testing, and ambient-baseline monitoring of the new point-of-compliance (POC) wells.

Reporting for these permits is performed separately. Some information may pertain to overlapping requirements of the permits.

In a letter dated April 26, 2017, USEPA stated that mechanical integrity testing (MIT) performed prior to the authorization of R9UIC-AZ3FY11-1 shall be subject to the existing facility permit AZ396000001. As such, MIT results and related abandonment activities are reported below.

(a) A map showing the current status of the mine

Figure 1 shows the Sitewide monitoring area, including the POC wells and the 97/98 well field. The POC wells and the pond continue to be monitored. There are no other current activities relating to the Sitewide permits. Figure 2 shows the approximate layout of the 97/98 well field, injection, recovery, and observation wells. Please note these figures do not show wells pertaining to permit R9UIC-AZ3FY11-1.

(b) A table and graph showing daily cumulative injection flows and extraction flows in each active mine block over the reporting period

There are currently no active mine blocks authorized by the Sitewide permits. Hydraulic control for the 97/98 test block was discontinued on September 1, 2004 and the test field remains inactive. Accordingly, there are no injection or extraction flows to report.

(c) A table and graph comparing average daily head in the four observation wells surrounding each active mine block with that of the four adjacent extraction wells

There are currently no Sitewide active mine blocks. Hydraulic control was not required during this reporting period for the 97/98 test block and water-level measurements are not required.

(d) A table showing POC monitoring wells analytical results and Alert Levels (ALs)

The POC Quarterly Compliance Monitoring Report is included as Attachment 1. The report summarizes the results of groundwater monitoring activities and includes tables of the field parameters and analytical results for the quarterly monitoring parameters. Brown and Caldwell, along with project personnel, conducted quarterly compliance sampling on November 8 through November 22, 2017.

Quarterly parameters were analyzed for 29 of the 31 POC monitoring wells. POC monitoring wells M32-UBF and M33-UBF were dry and could not be sampled.

Due to concerns of long-term well integrity, replacement wells for M16-GU and M20-O were installed in early 2017. The ADEQ and USEPA were notified of the intent to replace the wells. Both sets of wells were monitored in the Fourth Quarter 2017 for comparison purposes. The results from the replacement wells were comparable to the original wells. Sampling of the original wells will be discontinued.

Sulfate has exceeded the AL in M1-GL since the Third Quarter 2011. No Aquifer Quality Limit (AQL) has been set for sulfate, and there is no established Aquifer Water Quality Standard (AWQS). A report has been submitted demonstrating that the AL exceedance is not related to the permitted mining activities and routine quarterly monitoring for the well resumed during the Third Quarter 2012 event. There were no other exceedances of ALs or AQLs.

(e) Results of the monthly analyses of organic in the injectate

Organic analyses are not required because no solution was injected during the reporting period.

(f) Results of monitoring required by 40 CFR 146.33 (b)(1)

No solution was injected.

(g) Results of the mechanical integrity tests

No MITs were performed during the quarter.

(h) Results of the annular conductivity monitoring

Although injection in the 97/98 test block ceased in early 1998, annular conductivity measurements have continued to the present time. A graph showing measurement results for this reporting period is presented on Figure 3. No unusual conditions were noted.

(i) Well and core hole plugging and abandonment

No well or core hole abandonment activities were performed during the quarter.

(j) A summary of closure operations during the reporting period

There were no closure operations during the reporting period.

Florence Copper believes that you will find this report complete and in compliance with all permit conditions. Please contact me at (520) 374-3984 Ext. 3710 should you have any questions regarding this report.

Sincerely,

Florence Copper Inc.

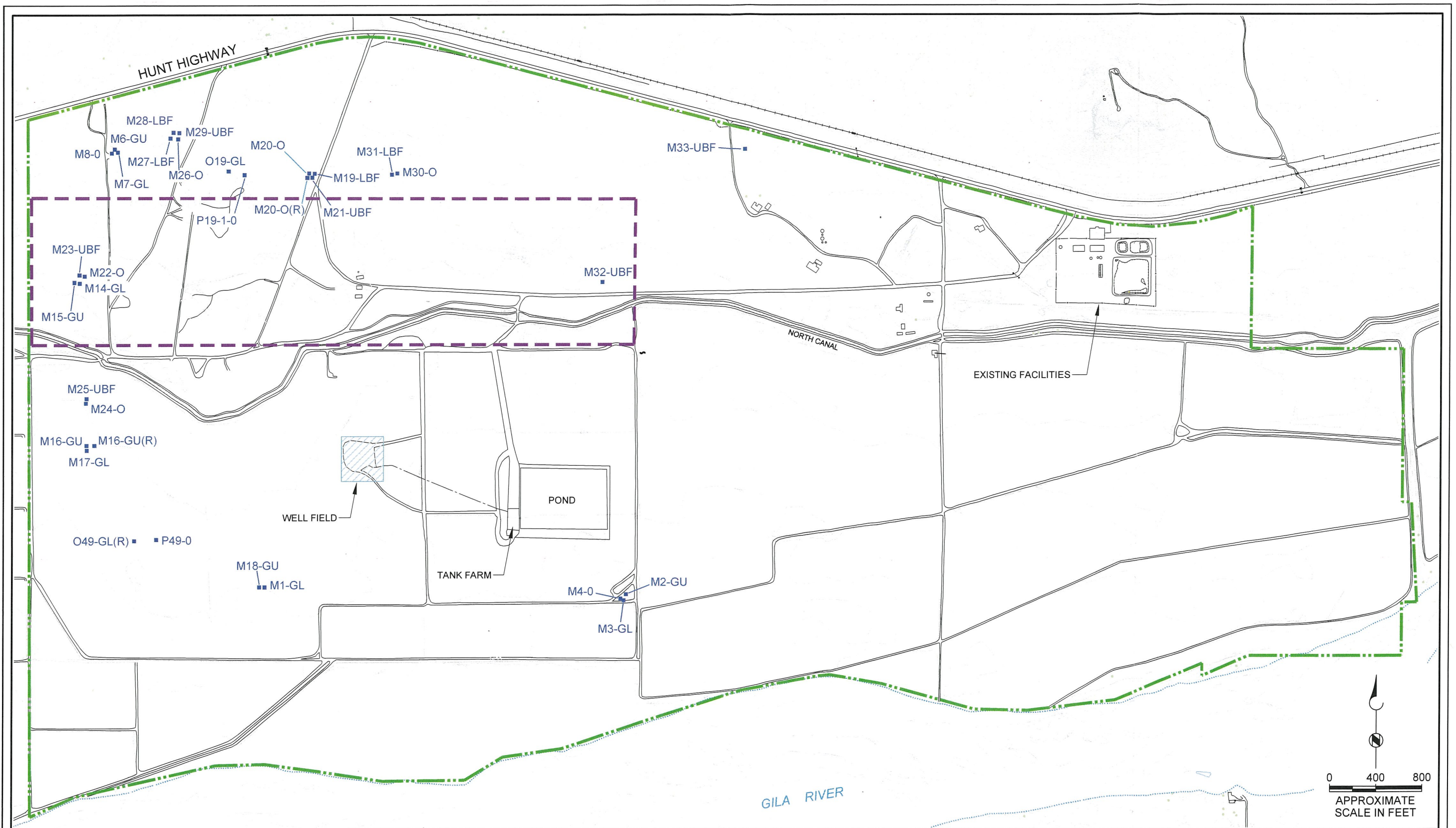


Daniel Johnson
Vice President / General Manager

BAS:cr

Attachments

cc: Florence Copper File



EXPLANATION

- APPROXIMATE PROPERTY BOUNDARY
- STATE LEASE LAND BOUNDARY
- M3-GL POC MONITORING WELL
- WELL FIELD DETAIL, FIGURE 2

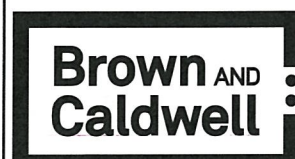
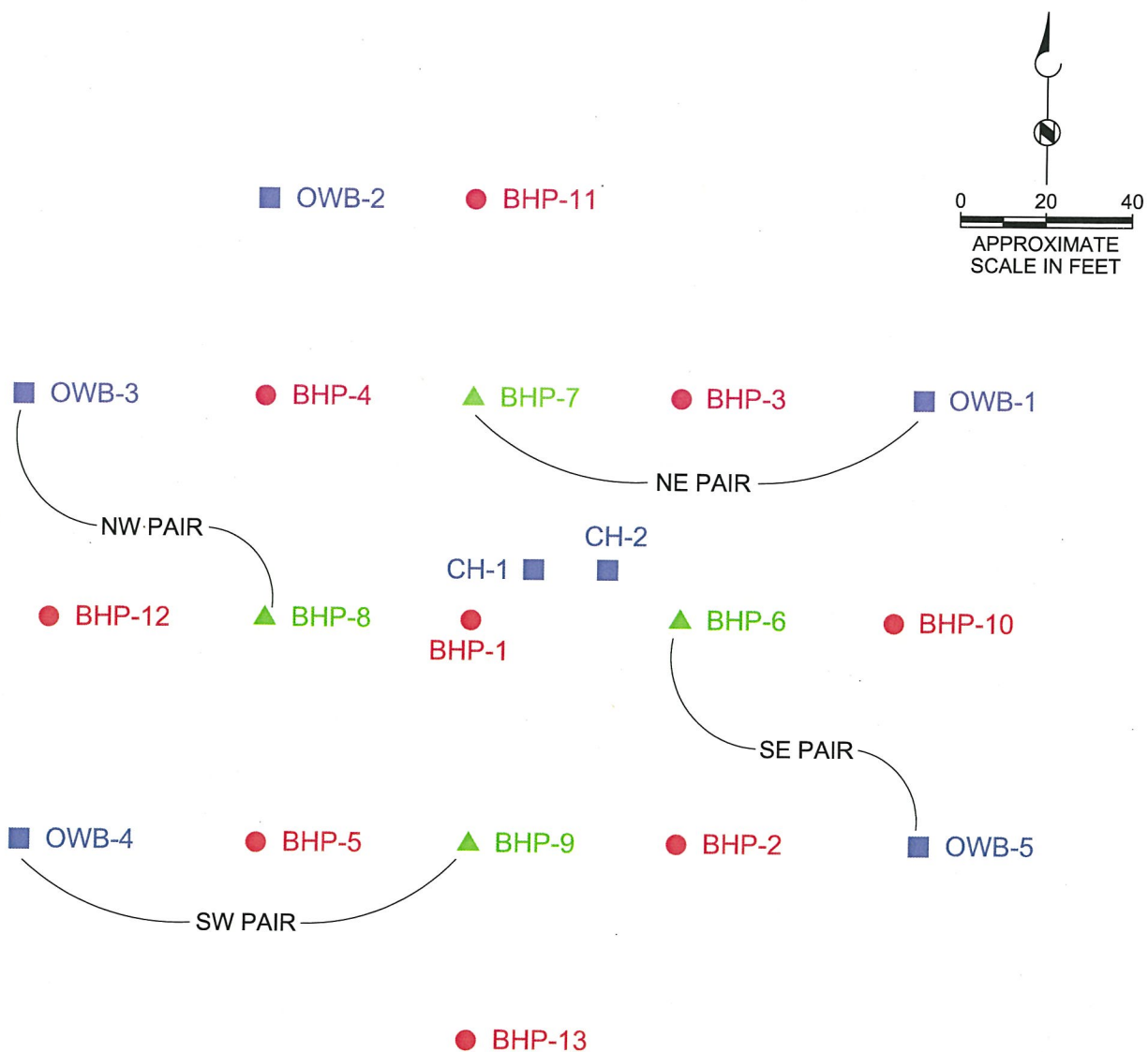


Figure 1
MONITORING AREA
 FLORENCE COPPER PROJECT
 FLORENCE, ARIZONA



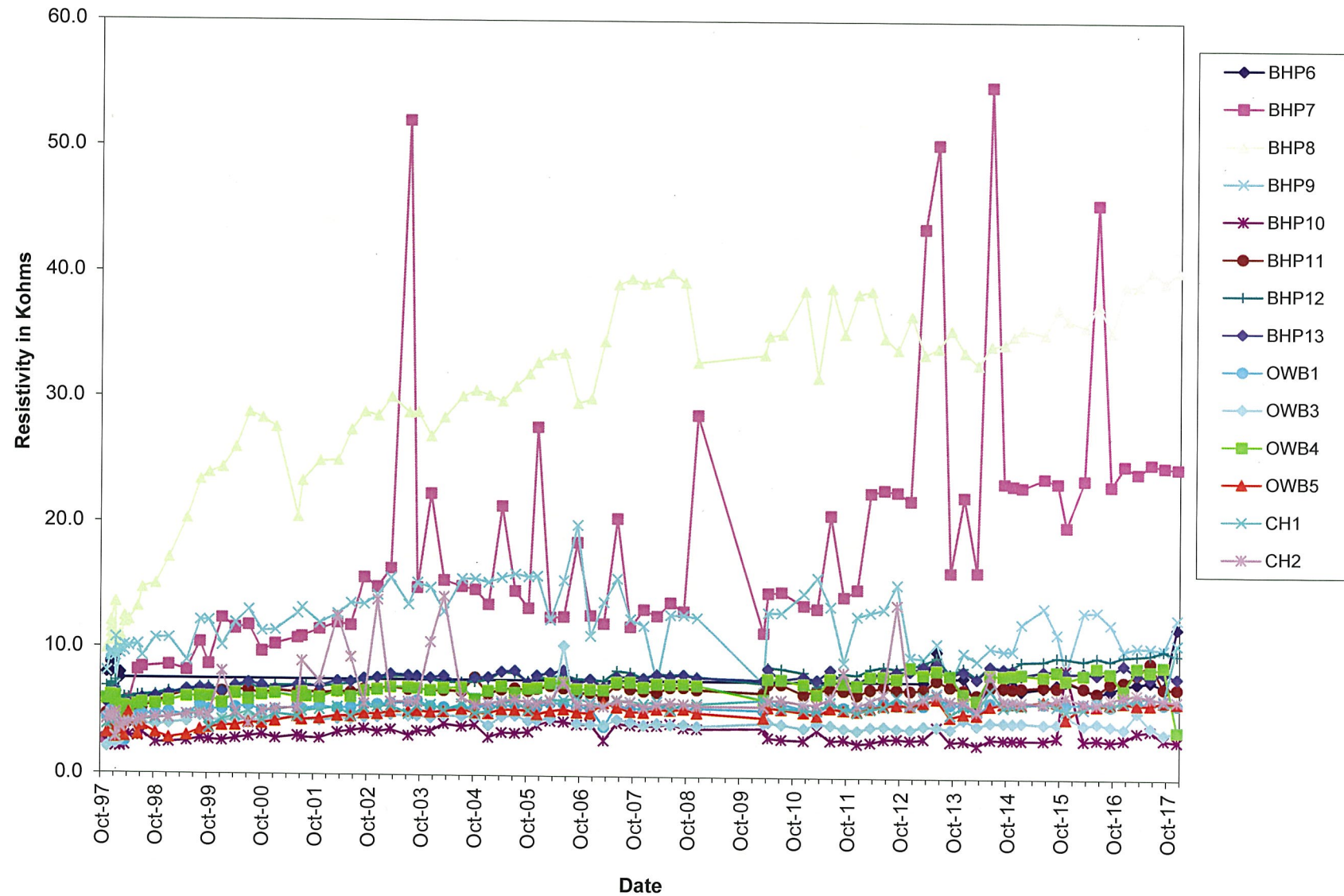
EXPLANATION

- BHP-10 RECOVERY WELL (CURRENTLY INACTIVE)
- OWB-2 OBSERVATION WELL
- ▲ BHP-8 INJECTION / RECOVERY WELL
(RECOVERY MODE SINCE 1998)

Brown AND
Caldwell

Figure 2
WELL FIELD LAYOUT
FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

Figure 3 - Well Field Annular Resistivity

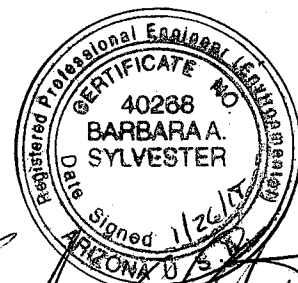


Brown & Caldwell

ATTACHMENT 1

POC Quarterly Compliance Monitoring Report

FLORENCE COPPER PROJECT
QUARTERLY COMPLIANCE MONITORING REPORT
SITEWIDE PERMITS
FOURTH QUARTER 2017



The Florence Copper Project is subject to four related permits issued by the Arizona Department of Environmental Quality (ADEQ) and the United States Environmental Protection Agency (USEPA).

Sitewide permits covering the 1997-98 Pilot Test Facility and possible future operations

- ADEQ Aquifer Protection Permit (APP) No. P-101704 dated October 13, 2017
- USEPA Underground Injection Control (UIC) No. AZ396000001 dated May 1, 1997

2018-19 Pilot Test Facility

- ADEQ Temporary APP No. P-106360 dated August 3, 2016
- USEPA UIC No. R9UIC-AZ3FY11-1 dated December 20, 2016

This report documents sampling activities relating to the Sitewide permits.

Sampling Activities

Groundwater sampling took place on November 8 through November 22, 2017 (Fourth Quarter 2017). Groundwater sampling and analysis was conducted in accordance with the requirements of APP No. 101704, Section 2.5.3 (Groundwater Monitoring and Sampling Protocols) and UIC Permit No. AZ396000001 Part II.F.

Quarterly parameters, as listed in Section 4.0 Table 4.5 of the APP, were analyzed from the designated Point of Compliance (POC) wells. The quarterly analytical parameters are magnesium, sulfate, fluoride, and total dissolved solids (TDS), in addition to field pH, temperature, and specific conductance. The field parameters of dissolved oxygen (DO) and turbidity are also monitored to determine stabilization of wells sampled using low-flow purging methods, but are not reported.

During the Fourth Quarter 2017 sampling event, 29 POC wells were sampled. Two POC wells (M32-UBF and M33-UBF) were dry and could not be sampled.

Due to concerns of long-term well integrity, replacement wells for M16-GU and M20-O were installed in early 2017. The ADEQ and USEPA were notified of the intent to replace the wells. The November 2017 APP permit authorized the replacement wells as the POC monitoring points. Both sets of wells were monitored in the Fourth Quarter 2017 for comparison purposes.

Analyses of the samples were conducted by Turner Laboratories. Analytical results for the quarterly parameters are provided in Table 1, and field parameters measured during sampling are indicated in Table 2.

The majority of the monitoring well network is equipped with low-flow bladder pumps. Low-flow sampling was conducted in accordance with Section 2.5.3 (Groundwater Monitoring and Sampling Protocols). Wells M16-GU, M20-O, M22-O, M24-O, O49-GL(R) and P49-O are equipped with stainless-steel electric pumps. The wells were sampled by purging a minimum of three borehole volumes, except for M20-O, which was purged dry for two consecutive days and allowed to recharge prior to sampling. No reduced pumping volumes occurred, and there were no other modified sampling procedures noted. Following sampling of the original wells, the electric pumps were relocated into replacement wells M16-GU(R) and M20-O(R). M16-GU(R) was sampled by three-borehole volume purging; while M20-O(R) continues to be sampled by purging for two consecutive days and allowing to recharge prior to sampling.

There were no exceedances of alert levels (ALs) in the monitoring network, with the exception of sulfate in upgradient well M1-GL, which has been above the AL since the Third Quarter 2011. No Aquifer Quality Limit (AQL) has been set for sulfate, and there is no established Aquifer Water Quality Standard (AWQS). A report has been submitted demonstrating that the AL exceedance is not related to the permitted mining activities, and routine quarterly monitoring for the well resumed during the Third Quarter 2012 event.

The results for replacement wells M16-GU(R) and M20-O(R) were comparable to the original wells. Sampling of the original wells will be discontinued.

As described above, a general increase in sulfate concentrations in M1-GL has been observed since 2000. A similar general increase has been observed in sulfate concentrations in M27-LBF since 2000; however, there is no sulfate increase in nearby wells M28-LBF, which is screened below M27-LBF or M29-UBF, which is screened above M27-LBF. This trend has decreased and/or stabilized since 2013. Recently, concentrations of magnesium, sulfate, and TDS appear to be increasing in upgradient wells M2-GU, M3-GL, and M4-O. In the upper aquifer, a decreasing trend for magnesium concentrations and an increasing trend for fluoride concentrations were observed from 2000 to 2008, stabilizing since 2008. Rising concentrations were also observed in upgradient wells M2-GU and M18-GU for magnesium, sulfate, and TDS from 2005 to 2007, stabilizing somewhat since 2008. Sitewide water levels have declined more than 50 feet in all three aquifer zones since the start of monitoring in 1996. Levels had stabilized or recovered from 2004 to 2011, decreased through 2013, and have stabilized again.

Contingency Sampling Plans

No contingency sampling plan was required during the Fourth Quarter 2017. No contingency sampling plan is required for the First Quarter 2018.

Table 1. Summary of Analytical Results, Quarterly Parameters

Well ID	Sample Date	Magnesium		Sulfate		Fluoride		Total Dissolved Solids	
		Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level
M1-GL	Nov 14 2017	19	31	130	109	0.54	1.3	660	1028
M2-GU	Nov 14 2017	28	39	200	275	0.59	1.4	970	1496
M3-GL	Nov 15 2017	19	36	150	187	0.52	1.3	700	1157
M4-O	Nov 15 2017	6.3	15	82	405	2.3	5.1	510	1072
M6-GU	Nov 10 2017	2.1	5.1	54	86	0.52	1.3	350	620
M7-GL	Nov 10 2017	<0.2	1	9	82	0.8	1.7	260	464
M8-O	Nov 13 2017	<0.2	1	56	122	2.1	3.6	370	609
M14-GL	Nov 13 2017	1.4	23	50	144	0.46	1.4	390	874
M15-GU	Nov 13 2017	18	44	70	126	<0.4	1.2	630	1359
M16-GU	Nov 16 2017	24	52	190	248	0.43	1.1	890	1635
M16-GU(R)	Nov 21 2017	26	52	190	248	<0.4	1.1	910	1635
M17-GL	Nov 14 2017	3.3	9.3	79	209	0.5	1.6	380	831
M18-GU	Nov 14 2017	23	36	190	288	0.69	1.6	920	1323
M19-LBF	Nov 09 2017	11	21	53	89	<0.4	1	440	794
M20-O	Nov 15 2017	7.9	14	68	112	0.62	1.7	480	809
M20-O(R)	Nov 22 2017	8.4	14	71	112	0.67	1.7	500	809
M21-UBF	Nov 08 2017	25	87	190	487	0.68	1.1	900	2867
M21-UBF (Dup)	Nov 08 2017	24	87	190	487	0.68	1.1	900	2867
M22-O	Nov 16 2017	5.9	8.6	55	86	0.57	1.3	410	1094
M23-UBF	Nov 13 2017	24	69	240	411	0.59	1.3	1100	2392
M24-O	Nov 15 2017	8.2	19	740	1364	0.92	2.5	1200	2363
M25-UBF	Nov 13 2017	39	76	260	387	0.44	1.6	1400	2683
M26-O	Nov 09 2017	<0.2	1	54	105	1.3	3.4	300	556
M27-LBF	Nov 09 2017	28	51	150	179	<0.4	1	1000	1745
M28-LBF	Nov 10 2017	0.77	2.6	6	81	0.59	1.6	320	610
M29-UBF	Nov 10 2017	24	84	200	465	0.56	1.1	940	2751
M30-O	Nov 08 2017	11	18	62	102	0.59	1.6	490	824
M31-LBF	Nov 08 2017	21	46	190	330	0.69	1.3	840	1665
O19-GL	Nov 09 2017	9.8	17	59	99	0.45	1.4	450	770
O49-GL(R)	Nov 10 2017	13	18	92	159	<0.4	1	760	849
O49-GL(R) (Dup)	Nov 10 2017	13	18	92	159	<0.4	1	750	849
P19-1-O	Nov 09 2017	5.1	12	65	107	1.4	2.8	450	767
P49-O	Nov 14 2017	3.1	6.2	110	181	0.81	2	450	801
P49-O (Dup)	Nov 14 2017	3.1	6.2	110	181	0.82	2	450	801
Arizona Aquifer Water Quality Standard						4			

All Results in Milligrams per Liter (mg/l)

< = Less than the Laboratory Practical Quantitation Limit

NA = Not Analyzed

Brown AND Caldwell

Table 2. Summary of Quarterly Field Parameters

Well ID	Sample Date	Temperature (°C)	Temperature (°F)	pH	Conductivity (µmhos/cm)
M1-GL	Nov 14 2017	20.8	69.4	7.76	1151
M2-GU	Nov 14 2017	20.9	69.6	7.39	1591
M3-GL	Nov 15 2017	20.6	69.1	7.60	1155
M4-O	Nov 15 2017	21.3	70.3	7.74	820
M6-GU	Nov 10 2017	23.2	73.8	8.43	660
M7-GL	Nov 10 2017	24.3	75.7	9.46	471
M8-O	Nov 13 2017	23.4	74.1	9.22	621
M14-GL	Nov 13 2017	22.3	72.1	8.30	757
M15-GU	Nov 13 2017	22.1	71.8	7.51	1138
M16-GU	Nov 16 2017	23.8	74.8	7.68	1460
M16-GU(R)	Nov 21 2017	23.2	73.8	7.58	1521
M17-GL	Nov 14 2017	21.7	71.1	8.98	691
M18-GU	Nov 14 2017	20.3	68.5	7.69	1552
M19-LBF	Nov 09 2017	22.6	72.7	7.75	797
M20-O	Nov 15 2017	22.8	73.0	7.70	772
M20-O(R)	Nov 22 2017	23.6	74.5	7.49	765
M21-UBF	Nov 08 2017	23.1	73.6	7.37	1531
M22-O	Nov 16 2017	27.7	81.9	8.30	731
M23-UBF	Nov 13 2017	22.0	71.6	7.33	1816
M24-O	Nov 15 2017	29.6	85.3	7.99	1721
M25-UBF	Nov 13 2017	22.3	72.1	7.14	2282
M26-O	Nov 09 2017	23.6	74.5	8.99	497
M27-LBF	Nov 09 2017	23.6	74.5	7.49	1646
M28-LBF	Nov 10 2017	23.1	73.6	9.20	603
M29-UBF	Nov 10 2017	22.5	72.5	7.39	1569
M30-O	Nov 08 2017	22.8	73.0	7.46	826
M31-LBF	Nov 08 2017	22.9	73.2	7.37	1418
O19-GL	Nov 09 2017	23.5	74.3	7.70	803
O49-GL(R)	Nov 10 2017	25.5	77.9	7.87	1231
P19-1-O	Nov 09 2017	22.4	72.3	7.71	733
P49-O	Nov 14 2017	27.5	81.5	7.80	756

°C = Degrees Celcius

°F = Degrees Fahrenheit

µmhos/cm = Micromhos per Centimeter